



3 Trends and Issues in Postgraduate Medical Education: Inputs, Outputs and Outcomes

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Executive Summary

Postgraduate medical education (PGME) in Canada is an essential component of physician supply in this country. The purpose of this paper is to examine whether the current *inputs* to PGME are producing the desired *outputs* and *outcomes*. Does PGME attract the right candidates for careers as physicians (inputs), and does the training system meet both the career objectives of residents and the health needs of society (outputs)? Do newly qualified physicians leave training prepared for independent practice and in appropriate practice models (outcomes)? And, finally, is the PGME system producing the right supply and mix of physicians, and are they working where they are needed (outputs and outcomes)?

While much progress has been made in creating planning tools, such as forecasting models, to predict and plan for physician supply, it is an inexact science and prone to broader economic, social and health system trends such as financial downturns and advances in medical technologies. The long-term nature of physician planning cycles creates vulnerabilities for governments and medical schools, such as sudden changes in the economy or in technology. Moreover, as the result of entry level quota, there is often too much focus on the intake to training and too little on the outputs and outcomes. The career choices of physicians (outputs) are influenced by their backgrounds, training settings and role models. To date these settings (particularly for specialists) are largely in academic health science centres. Many trainees in Canada have limited exposure to community-based practice or community physicians as role models.

For meaningful change to occur in physician distribution, changes in PGME training must be part of a comprehensive package of reforms that includes interprofessional practice models, professional and career support, and remuneration.

Meaningful implementation of interprofessional education and a translation of education models to service delivery is a critical element in ensuring PGME produces physicians who can work in teams and help to provide more continuity of care to the public.

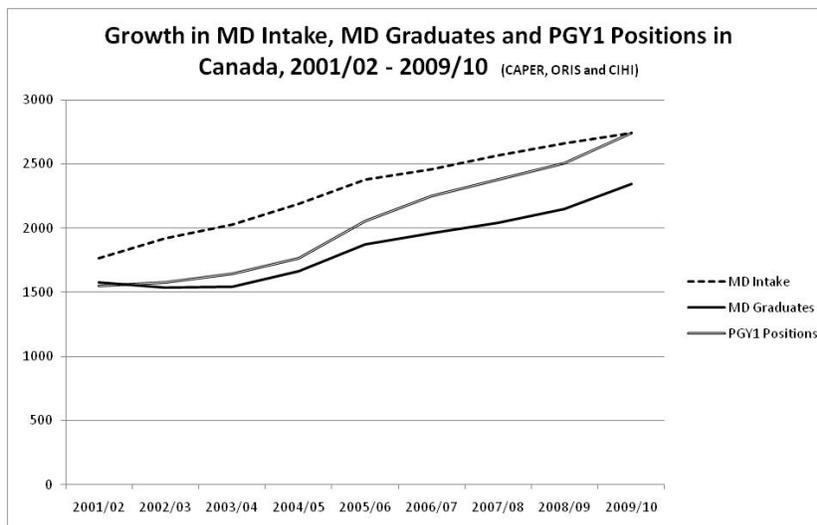
Three major considerations for future are:

1. An effective national health human resources planning process for PGME that includes PGME leaders, government representatives and health planning experts.
2. Selection processes for both undergraduate medical education and PGME that identify candidates' who will succeed in medical education, and whose personal goals and aspirations align with societal needs and expectations.
3. An integrated medical education approach to PGME.

Background

*Hundred years ago, a series of studies about the education of health professionals, led by the 1910 Flexner report sparked groundbreaking reforms. ... By the beginning of the 21st century, however, all is not well. ... New infectious, environmental, and behavioural risks, at a time of rapid demographic and epidemiological transitions, threaten health security of all. ... Health systems worldwide are struggling to keep up, as they become more complex and costly, placing additional demands on health workers. Professional education has not kept pace with these challenges.*¹ Since 2003/04, there has been unprecedented growth in postgraduate medical education (PGME) across the country (see Figure 1). Driven by concerns over physician shortages, governments and universities have expanded programs and created new training sites and medical schools. Between 2001 and 2009, postgraduate year one (PGY1) seats in PGME increased 77% (from 1,548 to 2,740), and these increases occurred across the country.² As a result, the number of new physicians entering the workforce each year is growing. Between 1999 and 2009, the overall supply of physicians in Canada increased by 19.7%. In 2005, there were 190 active physicians per 100,000 Canadians, compared with 201 physicians per 100,000 Canadians in 2009. In 2009, the annual growth rate of the number of physicians in Canada was 4.1%: the largest since the 1980s and more than triple the growth of the general population³— yet Canada’s health system continues to struggle to meet population health needs.⁴

Figure 1: Growth in MD Intake, MD Graduates and PGY1 Positions in Canada 2001/02 – 2009/10



The purpose of the PGME enterprise in Canada – 17 faculties of medicine in nine provinces – is to prepare highly skilled, competent family physicians, specialists, researchers and teachers who meet the professional standards and expectations set by the College of Family Physicians of Canada (CFPC) or the Royal College of Physicians and Surgeons of Canada (RCPSC). At the same time, as the Association of Faculties of Medicine (AFMC) states on its website (Social Accountability Mandate)⁵, medical schools have “the obligation to direct their education, research and service activities towards addressing the priority health concerns of the community, region, and/or nation they have a mandate to serve.” They also face increasing pressure to produce physicians who can help meet broader health system goals (e.g., patient-

centred care, efficiency, safety, sustainability) by working effectively in new service delivery models, such as interprofessional collaborative teams.⁶

Given the substantial public investment in PGME, it is legitimate to assess the impact of that investment and to pose the following questions as they relate to inputs, outputs and outcomes:

- Does PGME attract the right candidates for careers as physicians? Is the training system able to meet residents' individual goals and aspirations as well as society and the health system needs? (Inputs)
- Do new physicians leave their training programs prepared for independent practice as well as to work in new service delivery models – particularly interprofessional teams? (Outputs)
- Is the postgraduate medical training system producing the right number and mix of physicians to meet population health needs? Are new graduates working where they are needed? Do we have systems in place to maximize the public investment in educating and training doctors in Canada? (Outcomes)

This paper is one of 23 papers commissioned for the Future of Medical Education in Canada Postgraduate (FMEC PG) Project. This paper describes current workforce trends and issues that pose a challenge for PGME in Canada as well as opportunities to strengthen postgraduate medical education.

Methodology

The background research for this paper was obtained through an extensive literature search, key informant interviews and valuable feedback from a panel of Canadian experts.

The online literature search was conducted using Google Scholar, PubMed and Medline as well as using key health human resources (HHR) and academic medicine journals such as: Canadian Medical Association Journal; Academic Medicine; New England Journal of Medicine; the Lancet; Human Resources for Health; and Healthcare Policy to identify articles published in the last five years related to medical workforce and PGME planning. Searches were performed using key phrases such as “physician workforce” “physician supply” , “career choice” , “physician distribution” , “productivity” , and “interprofessional” ,

Authors also reviewed recent relevant documents (published and grey literature) from policy and research organizations, associations and accreditation bodies and medical workforce or HHR planning organizations including: Advisory Committee on Health Delivery and Human Resources, Canadian Association for Health Services Policy Research, UBC's Centre for Health Services and Policy Research, Ontario's Centre for Health Economics and Policy Analysis, Canadian Medical Association (CMA), the Michael Smith Foundation for Health Research, the Center for Productivity and Health Human Resources, the Organization for Economic Co-operation and Development (OECD), the World Health Organization (WHO), the Centre for the Study of Living Standards, Canadian Institute for Health Information (CIHI) and the Health Council of Canada, among others. Proceedings and documents of seminal conferences and related grey literature such as the International Medical Workforce Collaborative and the AAMC Physician Workforce Research Conference, as well as statistics related to PGME intake and output produced by the Canadian Postgraduate Education Registry (CAPER) and the Canadian Resident Matching System (CaRMS) were also reviewed.

Key informant interviews were conducted with knowledgeable individuals from government, medical schools and medical education organizations. A national panel of experts reviewed draft versions as well as the final draft. Appendix 3 contains the semi-structured interview questions.

Discussions and Results

Some of the major themes emerging from the research included: the ongoing question of supply and planning processes and tools; capacity for training; balancing residents' expectations with population health needs; the selection process into medicine and residency; the education experience as a determinant of future practice; geographic maldistribution; teamwork; and productivity.

Oversupply? Undersupply? Are we training too many or too few?

The increase in PGY positions over the past five years was in response to an existing physician shortage that would only be exacerbated by an aging workforce⁷. Governments are increasingly reliant on HHR models to predict requirements for physicians. While HHR modeling and forecasting reflects factors such as workforce demographics and changing health needs, it is an inexact science and often the victim of broader social and economic factors, as well as new technologies and advances in practice.

A recent review of HHR forecasting models suggests that many jurisdictions in Canada -- including Quebec, Nova Scotia, Manitoba, Ontario and Alberta -- are utilizing needs-based approaches to predict health workforce requirements. These models predict an increase in the discrete supply of physicians, but concerns remain about whether the added number of physicians across all specialties will be enough to address health needs given our growing and aging population. The 2007 CMA report on national physician supply projections predicts significant growth in the supply of physicians (from 1.9 FTEs per 1,000 population to 2.5 per 1,000 population by 2030).⁸ However, when these forecasts are adjusted to reflect two key trends -- new physicians and female physicians working fewer hours and increased work intensity due to an aging population -- the model predicts an overall shortfall of at least 4,000 physicians (or 6%).

Very recent demand-based workforce modeling in Ontario predicts a different scenario. The base case in this model (see Figure 2) predicts that the shortage of specialists and family physicians will end by 2014 and 2017 respectively and the province will have a significant oversupply of specialists.⁹ A closer look at the modeling shows that the oversupply will be in certain specialties, such as pediatrics, obstetrics, general surgery and orthopedic surgery (see Figure 3), while others -- like psychiatry, cardiology and ophthalmology -- will continue to be in shortfall.

Figure 2: Base Case Scenario 3 – Simulation of Physician Variance 2008-2030

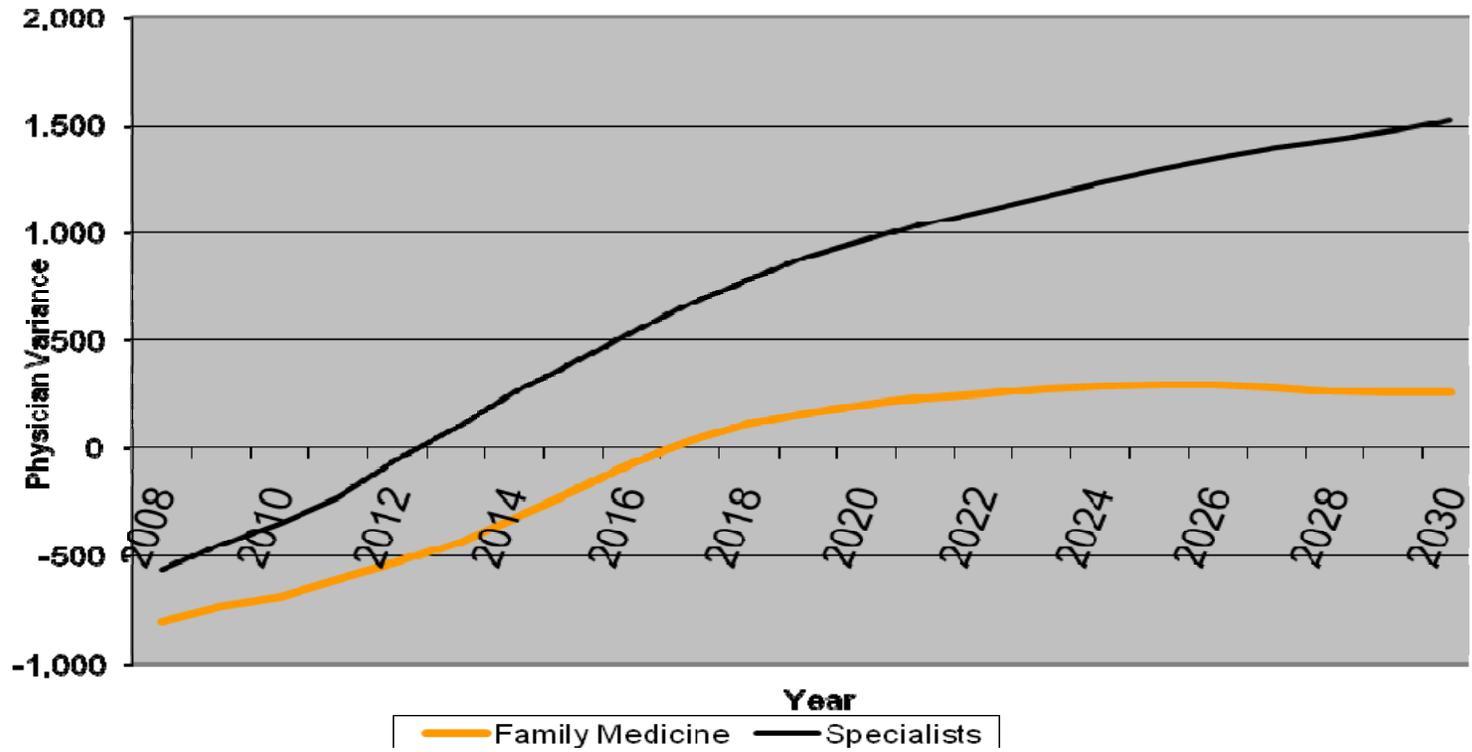
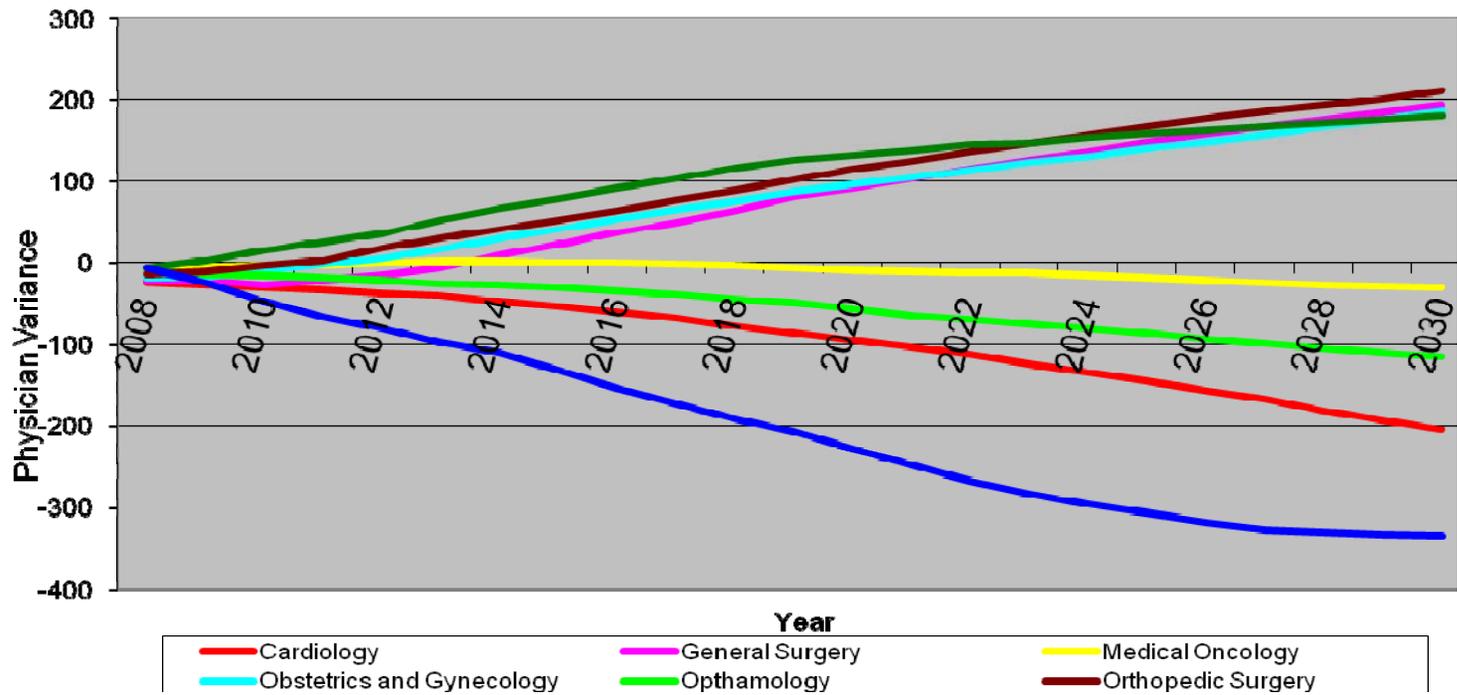


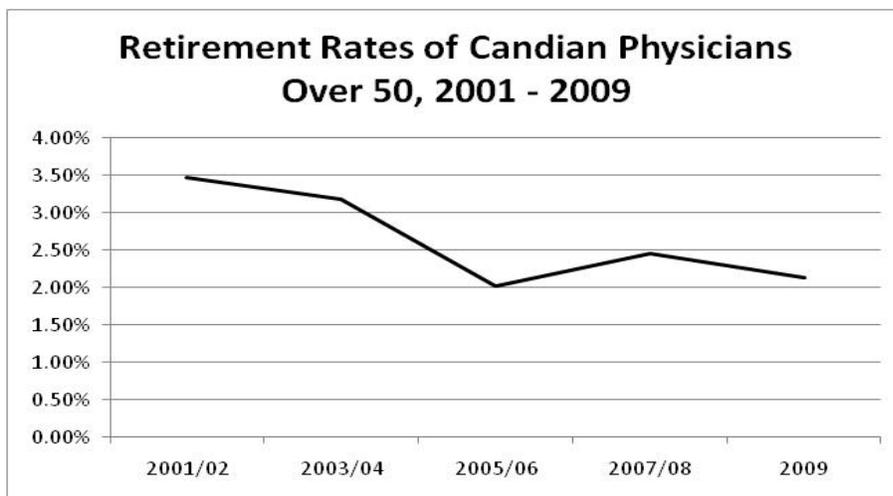
Figure 3: Base Case Scenario 3 – Simulation of Select Specialty Variances 2008-2030



There are concerns about whether these projections are starting from a point that clearly represents sufficiency and accurately reflect the ongoing challenge of addressing the real needs of an aging and informed population. As L. Buske points out “Technology continues to both increase efficiency of medical treatment as well as make possible an even greater array of diagnostic and therapeutic techniques. People with diseases such as AIDS are living longer and requiring more years of medical treatment. The number of cancer survivors is increasing but with that goes an increased number of people who require relatively intensive use of the medical system for their ‘chronic’ condition.”¹⁰ Although the Ontario projections may not be representative of other parts of the country, they reinforce the importance of good data and scenario planning to inform the allocation of PGY positions.

Forecasts must also take into account current trends in physician practice, particularly the trend to delay retirement. In 2004, planners forecast that roughly 3,800 physicians could retire in the following two years, double the previous retirement rate.¹¹ Many increases in PGY positions were timed to produce new doctors to compensate for the anticipated wave of retirements. In fact, based on recent data from the CMA, the retirement rate for physicians over 50 has been declining – not increasing -- for the past 10 years (Figure 4). This is likely due to a number of factors, including: the ability of physicians to scale down their practices rather than exit entirely; the recent downturn in the economy; and the more recent elimination of mandatory retirement. The trend for physicians to continue working at least part-time into their 60s and 70s will have a profound impact on the supply of physicians and opportunities for new physicians. Some jurisdictions in Canada are considering physician pensions as a way to facilitate retirement and retain new physicians.

Figure 4: Retirement Rates of Canadian Physicians Over 50, 2001-2009



Source: CMA, 2010.

Physician forecasting must also take into account the potential impact of interprofessional teams and expanded scopes and roles for other healthcare professionals as well as physician supply and demand in other jurisdictions. The United States (US) is anticipating a shortfall of 22,000 primary care physicians by 2020, which may lead to intense recruitment of Canadian-trained doctors.¹²

The Capacity to Train New Physicians: Teaching vs. Service

While the publicly funded Canadian healthcare system is committed to helping train new physicians and other healthcare professionals, it must provide healthcare services as efficiently and effectively as possible. These two goals are often in conflict. As Bates et al reported, “While some learners at senior levels contribute to the overall capacity of health services delivery, in general, introducing learners into clinical settings reduces the efficiency of service delivery by all healthcare workers, including physicians. ... If education is to be seen as a core healthcare function, a certain element of ‘operational inefficiency’ will need to be acceptable and cost as a part of healthcare as trainee numbers increase ... but academic programs must also examine their educational programs to ensure the most effective use of clinician teachers and clinical settings.”¹³

Education requires human resources (e.g., clinical teachers) and infrastructure (e.g., clinical and teaching space). Faculty members are the ultimate resource to support medical education: “the teachers, stewards, agents of knowledge transmission, and most importantly role models for students ... Faculty challenges in most countries consist of heavy teaching loads, shortage of teachers, competing demands for research and consultancy services, and the hazards of mid career exhaustion.”¹⁴ While expansion has placed a burden on the healthcare education enterprise, it has also created opportunities to seek out new training venues and settings. The shift to distributed medical education may relieve some of the pressure by spreading the activity across a larger number of sites and teachers. Based on the experience in British Columbia (BC), the community-based physicians who participate in teaching benefit significantly from the experience because it helps them keep current and be part of the academic enterprise. It has been suggested that the involvement of community physicians in teaching is leading to better quality services. That being said, the program was realistic about the infrastructure costs involved. As one key informant noted, “It’s not just about training residents, it’s about doing it differently in different regions. The funding formula has to reflect what it costs to train a resident and support the distributed infrastructure. ... The costs of infrastructure should be embedded in costs for PGME, and tied to outputs and outcomes.”

To reduce the demands of student learners on the healthcare system, new methods of clinical teaching, using simulation and standardized patients, must be developed and funded.¹⁵ These methods are currently under development and need to be more adequately researched and, where effective, resourced.

Conflicting Expectations? Balancing societal needs and resident aspirations

Faced with growing, aging and more culturally diverse populations, health systems across the country have identified the need for more primary care, more care related to chronic diseases, more mental health, geriatric and long-term care services, more culturally competent care, and new service delivery models, including a stronger focus on patient-centred care, preventive care, better access to care (24/7), comprehensive family care teams, more interprofessional practices, chronic disease management, shorter wait times for acute care services, more effective communication with patients, expanded scopes of practice, and new roles.¹⁶ Many of these expectations are reflected in the CanMEDS physician competencies, which emphasize communication, collaboration and advocacy skills as well as medical expertise.¹⁷

While most medical schools have a social mission and recognize their responsibility to prepare physicians to improve patient health, there continue to be gaps between the aspirations of

students who enter PGME, workplace opportunities for them and population health needs. Several recent studies have looked at factors affecting specialty choice for North American medical students.^{18 19 20} Lifestyle is a major determinant of residency choice, explaining 55% of variation in residency selection: students forgo noncontrollable lifestyle specialties (e.g., obstetrics–gynecology, general surgery, orthopedics, neurosurgery, urology, primary care) in favor of controllable lifestyle specialties²¹. Resident aspirations may also be the driving force behind other trends in physician practice affecting the outputs and outcomes of PGME, including:

- an increase in boutique or designer practices where family physicians either specialize in one area of medicine (e.g., sports medicine) or choose which aspects of care they will or will not provide (e.g., less on call, no care in nursing homes, no obstetrics)
- more physicians pursuing careers in research and healthcare administration
- more residency graduates pursuing fellowships and additional training rather than working in a specialty or geographic area not of their choice.²²

i) Selecting for Social Responsibility.

Mohsen et al argue that the lack of understanding on the part of medical students of patient needs impedes their ability to determine the impact of their career choices.²³ If students had a better understanding going into medicine, their goals might be better aligned with needs. This argument is borne out by the experience of the distributed medical education program in BC, where students are recruited to a particular region and are asked key questions as part of the admissions process (e.g., Why are you interested in training in a rural site? What in your background helped develop this interest). The admission panel includes a community physician as well as academic physicians; the admission criteria reward students who have an interest in serving special populations or working in rural areas, and students are selected for their ability to succeed within a specific community. They are involved and work with that community from the beginning of their training and have a clear understanding of the community's needs. Their choice of residency training is more likely to be based on community needs as well as their own personal aspirations. The BC experience highlights the importance of the admission process in selecting students whose personal goals and aspirations are more aligned with societal needs.

Although the CanMEDS roles emphasize a range of competencies, most admission processes continue to focus primarily on academic achievement. However, some evidence of personality-based admissions testing is gradually emerging:

- As part of the US plan to expand the number of medical schools, recruiters are looking at specific student attributes or attitudes that translate into physicians who are more likely to pursue practices that meet health needs. For example, people who served in the US Peace Corps or who are more altruistic are more likely to choose family medicine.
- The Mayo Clinic uses Gallup personality assessments to filter applicants and select those who – in addition to academic ability – have strong interpersonal skills.
- The general surgery program at the University of Toronto assesses its short list of CaRMS applicants on their performance in a clinical scenario - generally with an error or miscommunication - to understand how they handle issues such as disclosure.

ii) Shaping education

While the application process can help attract students who are interested in pursuing medical careers that meet societal needs, the medical education process itself is crucial. A significant proportion of students enter medical school either undecided or planning to choose family medicine. However, their intent changes significantly by second year.^{24 25}

The literature argues that this because most training still occurs in acute care settings – often tertiary and quaternary settings – and students receive little education in health promotion, disease prevention or the importance of nutrition and exercise in health – all key preventive tools for family physicians.²⁶ As Woollard notes, “The vast majority of medical schools in the 20th and 21st centuries have focused their teaching almost exclusively on the one in a thousand patients who reach the teaching hospital, not the 217 who visit doctors’ surgeries and certainly not the 750 who may represent ‘teachable moments’ for health promotion and disease prevention.”

Governments have tried to temper the trend to specialize by allocating specific numbers of seats for family medicine and, in many jurisdictions, this has been effective. Faculties of medicine are ensuring a more positive exposure to family medicine. For example, at the University of Montreal, 42 to 43% of students are now choosing family medicine, which is closer to meeting the expectations of Canadian society. The university has made changes to the undergraduate curriculum to give students more time in family medicine. A pilot project in 2010-11 is offering longer rotations (three months), time in private physician offices and a focus on interesting cases. Across the country, the percentage of Canadian medical students choosing family medicine as their first choice has increased from 26.4% in 2004 to almost 32% in 2010 (CaRMS).

The factors that encourage students to choose to practice family medicine or specialties in need include: role models, quality clinical experiences in the community and in specialties of need (e.g., psychiatry), early exposure to specialties in need, training in interprofessional teams, foundation programs that expose all students to general practice as a foundation for all medicine, third year training in family medicine (particularly for its impact on out-of-office services), and feeling well prepared for practice (e.g., opportunities to shadow mentors, problem-based learning courses, teaching that is relevant to the demands of practice, training where they will provide care so they develop a support system, access to ongoing help and advice). While faculties of medicine are well aware of the literature, their ability to offer the kind of learning experiences that will draw students to practice in areas of need may be limited by the fact that teaching hospitals rely heavily on residents to deliver services over the course of their training.^{27 28 29 30 31 32}

Factors that discourage students from choosing to practice in areas of need include: the heavy workload, unattractive practice environments, too much emphasis on research in their training, and the differential compensation for different specialties.^{33 34 35 36 37 38} The cost of medical education – and the amount of debt that residents have by the end of their training – can lead them to choose specialties that offer higher levels of remuneration. In the US, the high cost of undergraduate medical education limits the mix of students applying for postgraduate medicine as well as their choice of specialty, keeping those from lower income families out of medicine and affecting the diversity of the physician workforce.

iii) Encouraging cultural competency

In terms of cultural competency – the ability to serve our increasingly diverse population – some faculties of medicine have made significant progress in attracting a more diverse mix of students, often reflecting the diverse ethnicity of our large Canadian cities. Some jurisdictions, such as BC, have also made great strides in attracting Aboriginal students into undergraduate programs at distributed sites. Aboriginal and other students interested in working in Northern BC work with Aboriginal elders in their training so they know what is involved in serving Aboriginal communities. The education program goes beyond ensuring all students are culturally aware or competent to “honouring and keeping the Aboriginal spirit safe in the delivery of healthcare

The Nagging Problem of Geographic Maldistribution

Despite efforts to prepare and recruit students to meet population health needs, Canadian physicians – particularly specialists -- are concentrated in urban areas. In 2004, fewer than 16% of family physicians and only 2.4% of specialists were located in rural and small town Canada compared to 21.1% of the population.³⁹

In 2010, when the Ontario Physician Simulation Model assessed geographic distribution by looking at projected physician supply by local health integration network (LHIN), it found that an urban area like Toronto will continue to be oversupplied.⁴⁰ Interestingly, the assessment also showed that the northern part of the province (an area that has had the investment in the Northern Ontario School of Medicine) will have an adequate supply of physicians while other parts of the province, characterized by smaller urban and rural populations, will continue to be underserved – both for family physicians and specialists. In New Brunswick, where new physicians can only set up practice in areas of need (i.e., billing numbers are only issued after an approval process that involves the Department of Health and regional health authorities), there is still a shortage of physicians willing to work in small, rural communities.

i) The effectiveness of distribution strategies

Distribution strategies linked to PGME, such as return-of-service, have met with varying success. Many jurisdictions target international medical graduates (IMGs) through return-of-service agreements to alleviate physician shortages in underserved regions. This strategy appears at first glance to be effective. A 2009 study by CIHI revealed that physicians in less urban areas are more likely to be IMGs. However, the impact of these return-of-service agreements is short-lived. While IMGs make up 52.8% of *new* physicians in rural or remote areas, 42.7% in areas formed by adjacent municipalities (census agglomeration or CA) and 25.2% in census metropolitan areas (CMAs), they account for only approximately one-quarter of physicians overall (25.6%) in rural or remote areas, 23.5% in CAs and 21.8% in CMAs. These data suggest that newly practicing IMGs begin practice in rural areas and then migrate over time to larger communities. A 2010 CIHI study looked more closely at migration patterns of new IMGs (i.e., entered practice in 1995 to 1999). By 2009, a large proportion of these IMGs in Newfoundland and Labrador (63.3%), Nova Scotia (77.5%), Manitoba (80.4%) and Saskatchewan (92.1%) had moved to Ontario, Alberta or British Columbia.⁴¹ Poor retention rates for new IMGs in rural and northern locations are often due to a lack of preparation for working in those settings⁴² – an issue that could be addressed during postgraduate medical training and the recruitment and selection process. For example, Manitoba reports that only 25% of residents who have financial assistance grants buy them out. Most of the people who

take the grants have been screened for their suitability to work in rural and remote areas and are planning to stay in Manitoba.

Faculties of medicine in Canada have stepped up to address issues of maldistribution and are now educating physicians outside of large urban tertiary centres. Innovative examples of distributed medical education, such as the Northern Ontario School of medicine, the University of British Columbia's (UBCs) satellite campuses, and the Dalhousie and Sherbrooke satellite campuses in New Brunswick, are now starting to demonstrate an impact on distribution. Roughly seven out of 10 graduates of the northern family medicine programs in Ontario remain in rural or northern Ontario two years after graduation.⁴³ The difference for many of these models of education is their ability to fully integrate their learners, many of whom come from rural and northern backgrounds, into the healthcare setting, community and model of practice. Students are learning in the environment where they may be expected to practice.

“We believe that exposing medical students and residents to rural practice has a better chance of success than more coercive methods such as return of service programs. We also realize medical education models are not solutions in themselves and have to be part of broader initiatives, such as the rural practice programs implemented by the BC government in conjunction with the BC Medical Association.⁴⁴

ii) Understanding the factors that affect retention in rural practice

While the right education can get physicians into rural and remote areas, it is not enough on its own to make them stay. Educators and policy makers must recognize the many factors that contribute to the making of a rural physician, over and above location of training – including service delivery models that establish a critical mass of health providers to create sustainability and insulate communities from the devastating impact of losing a single provider.⁴⁵ A 2008 CMA survey of rural physicians found that younger physicians attach greater importance to financial incentives to practice in a rural community than their older counterparts. Overall, rural physicians enjoyed the opportunity to use their full skill set (84%) as well as the rural lifestyle (82%). Of the 14% who registered their intention to move in the next two years, most reported that they would stay if they had a more reasonable workload, professional back-up and locums.

A recent study in Australia concluded that the strongest predictors of rural practice intention were generalist intentions, length of rural residence and holding a scholarship (but not a bonded arrangement), while intentions towards specialist practice or being supported by parents were negative indicators for rural practice.⁴⁶ Key informants suggest that students and trainees who are supported by parents are more likely to be from upper- and middle-class families from urban areas and, therefore, unlikely to be interested in rural practice.

More Teamwork? Expanded scopes, new roles and interprofessional practice

Over the past five years, some jurisdictions have expanded the scope of practice for a number of professions (e.g., nurse practitioners, pharmacists, physiotherapists, dietitians, midwives, medical radiation technologists, physiotherapists) and some have introduced new roles (e.g., physician assistants, nurse anaesthetists, surgical assistants, pharmacy assistants). In theory, these professionals should relieve some pressure on physicians, freeing them to focus on activities that require medical expertise. They may also help fill the care gap in rural and remote areas that have trouble attracting and retaining physicians.⁴⁷ (Wong et al., 2009)

While interprofessional collaborative practice appears to be a promising model for service delivery, it has not yet been widely adopted or supported with incentives. In 2007, almost 75% of family physicians reported working in group or interprofessional practices, but 51% were in physician group practices and only 24% in interprofessional settings -- while 23% were still practicing solo.⁴⁸ The number of comprehensive interprofessional collaborative practices remains relatively small (although growing) and is largely dependent on financial incentives provided by provincial governments.

In its comments on Bill 179, the Ontario legislation designed to facilitate interprofessional practice, the College of Physicians and Surgeons of Ontario noted that “providing expanded access to additional controlled acts to a variety of healthcare professions is only one element of interprofessional care (IPC). Effective IPC depends on attention to broader issues: funding mechanisms, electronic health records and a comprehensive resource planning process ...”⁴⁹ Although funding and other system issues continue to be barriers to interprofessional practice, key informants also identified the lack of interprofessional training at the postgraduate level as a major stumbling block. While a significant proportion of undergraduate education is now interprofessional, most postgraduate medical training continues to be physician and specialty specific, and highly siloed.⁵⁰

Value for money? A question of training costs, time and accountability

Both federal and provincial governments have invested substantially in the education and training of physicians in the last 10 years: expanding both undergraduate and postgraduate seats, adding designated training positions for IMGs, increasing the grants provided to universities to educate and train physicians, creating Academic Health Science Centre Alternate Payment Plans to provide financial stability for physicians who teach and do research as well as provide clinical care, and creating new distributed sites for medical education.

Based on recent Ontario estimates, it costs the public approximately \$285,000⁵¹ to train a family physician and \$760,000 to train a specialist in Canada (excluding the cost of medical school and further subspecialty training). Educating physicians is expensive, and it takes more time than it once did. Longer training times are due to: trainees choosing to continue their education beyond minimum certification requirements (e.g., research or fellowship); trainees deciding to do a fellowship (in academic centres) if a desired position is not available; and/or extra time required because of leaves taken during training (i.e., maternity, paternity, health or professional).⁵² A recent observed trend in Ontario is the inability of recent graduates to find employment in their chosen specialty and location, based on indicators such as an increasing number of surgical residents choosing to do fellowships and the growing number of graduating residents seeking help with employment through Health Force Ontario.

The length of training is an issue for the governments that fund PGME. As one government key informant noted, “We are not ready to discuss increase in length of training without compelling evidence that it will improve health outcomes.” The proposed shift to competency-based medical education (CBME) – which focuses on outcomes -- has the potential to reduce the time required to train physicians, enhance physician skills, prepare physicians to meet society’s health needs and make their training more flexible. “By providing experiences within a more flexible time frame and focusing on the learner’s development, CBME can help physicians-in-training to become truly engaged in a process that progresses at their own rate of acquisition.”⁵³

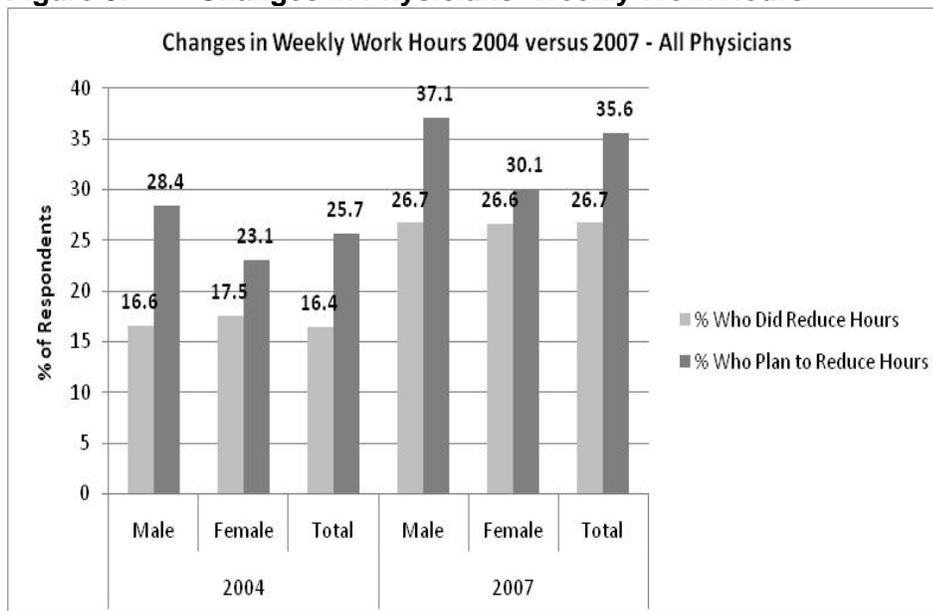
Less productivity? More physicians but not necessarily more service

Although Canada is now producing more physicians each year and the total physician workforce has increased by almost 20% in 10 years, health systems are not necessarily seeing a concomitant increase in service.

Physicians, on average, are working fewer hours, providing less direct and less comprehensive care (Chan 2002, Crossley et al 2009, Dauphinee and Buske 2006, Evans et al 2010). These trends are largely due to physicians' desire for greater work-life balance – both during their training and when they enter practice. The National Physician Survey conducted in 2004 and in 2007 reveals clear increases in the actual and planned intent – by both male and female physicians -- to reduce work hours (Figure 5). The observed drop in work hours has been attributed to a number of factors including:

- More women physicians⁵⁴ -- who are more likely than men to work part-time and to take parental and other leaves to meet their family's needs. (Maynard & Bloor)
- The exodus by young family physicians from primary care and especially from private, office-based practice and the growing trend to part-time practice – shifts attributed in part to policies designed to improve the delivery of secondary healthcare and the declining attractiveness of office-based practice (i.e., growing patient lists, greater difficulty accessing resources to support those clients).^{55 56}
- The shift away from fee-for-service compensation systems (particularly in family medicine), which may remove the incentives and rewards based on the number of patients seen – although there is some indication that the amount of service and throughput of patients is higher at community health centres, where an interprofessional model of care as well as administrative supports may enable physicians to be more productive.⁵⁷

Figure 5: Changes in Physicians' Weekly Work Hours



i) Relationship between work hours and productivity.

If number of hours worked is a true measure of productivity, these trends have serious implications for the sustainability of healthcare systems, given that the bulk of costs are attributable to health human resources.⁵⁸ However, a recent report prepared for the Canadian Health Services Research Foundation argues that the productivity of health human resources should be “defined in terms of the relationship between health outcomes achieved (health status protection or improvement for individuals or populations) and the health human resource inputs (time, effort, skills and knowledge) required.”⁵⁹ As the paper notes, “more MRIs or more radiologists may contribute to increased procedural output but do not necessarily result in better health outcomes or improved productivity.”

However productivity is defined, the shift to fewer working hours has immediate implications for postgraduate education both in terms of throughput and service expectations. As one key informant said, “When an older physician retires, we need two to three new ones to take over” and the postgraduate system must increase inputs and outputs to meet that demand. Another key informant questioned whether the service requirements of residents during training are reasonable (i.e., 80 hours a week in Canada compared to a maximum of 50 in the US and the United Kingdom). (Abrass et al, A Process for Reducing Workload and Enhancing Residents’ Education at an Academic Medical Centre, Acad Med 2001) In his view, if faculties of medicine and the clinical programs they support do not voluntarily change these expectations, the change may be legislated – which would have serious implications for settings that rely on residents’ services.

Summary and Considerations for the Future

In December 2010, the Global Commission on the Education of Health Professionals for the 21st Century released its report, setting out a systems-based framework for educating health professionals based on the connection between the education and health systems which reinforces the fundamental link between professional education on the one hand and health conditions on the other connections.⁶⁰

In light of the systems-based framework set out by the Global Commission, the following recommendations highlights three key gaps related to planning, selection and the necessary integration of PGME to reflect the strong connection between education and health systems.

1. An effective national HHR planning process for PGME that includes PGME leaders, government representatives and health planning experts.

As recently as 2006/07, the Postgraduate Medical Education Working Group of the Advisory Committee on Health Delivery and Human Resources (ACHDHR) met regularly with the Deans of Canadian faculties of medicine to discuss trends and keep current on the allocation of seats across Canada. According to key informants, this contact helped build stronger relationships between the education system and the health system, and was key to the progress made in the last 10 years in increasing physician supply, mix and distribution. Although jurisdictions continue to share information about their workforce planning, most efforts to develop the evidence to inform HHR planning and socially responsible medical education are occurring in isolation. This activity and evidence must be brought together to inform and advise all key stakeholders in PGME and physician resource planning, paying particular attention to:

- developing better health outcome performance measures
 - creating indicators of current and future healthcare needs
 - establishing mechanisms to mitigate the short-term fluctuations of physician employment cycles, retain new physician graduates and protect the public investment (e.g., organized retirement plans, national co-ordination of collective agreements).
 - developing a comprehensive approach to increasing the supply of physician services that includes training quotas and allocations as well as appropriate practice incentives and workplace settings (interprofessional collaboration).
2. Selection processes for both UGME and PGME that identify candidates' who will succeed in medical education, and whose personal goals and aspirations align with societal needs and expectations.

The selection process is key to ensuring that residents' personal aspirations and goals align with societal needs and expectations. Schools should be actively recruiting students who have both the academic ability and the attitudes to provide high quality medical care and respond to social needs. To make appropriate career choices – for themselves and for society -- students and trainees require early exposure to primary care and generalist settings as well as to tertiary hospitals and acute cases. Students and trainees must also be assessed in the context of their ability to succeed in medicine rather than their academic performance thus far.

3. An integrated medical education approach to PGME

Integrated medical education includes both geographic distribution and interprofessional education. It has the potential to improve geographic distribution of health human resources (outputs) and align training more closely with population health needs. Integrated education and training must be tailored to meet students' learning needs (competency-based) and must also be interprofessional. Team-based care seems to be key in improving productivity, particularly in primary care. As the Commission report (2010) notes, promoting interprofessional and transprofessional education will “break down professional silos while enhancing collaborative and non-hierarchical relationships in effective teams. Alongside specific technical skills, interprofessional education should focus on cross-cutting generic competencies, such as analytical abilities, leadership and management capabilities, and communication skills.”

To achieve full integration, postgraduate medical training in Canada must:

- create a framework for sustainable and distributed medical and interprofessional education that puts Canadian university programs at the forefront of producing healthcare professionals who can meet societal needs.
- set new standards for accreditation, teaching capacity and delivery of patient-centered, inter-professional, evidence-based healthcare , in urban, suburban and community settings.
- enhance learners' access to clinical teaching for all programs along the continuum of medical education.
- develop a sustainable financial plan that funds programs and teachers according to societal needs and learners' requirements; and monitors resource utilization for accountability and quality improvement

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Appendix 1: About the Authors

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Jean Bacon is a consultant and writer for numerous provincial and federal reports on health human resources and health systems. Jean Bacon has been instrumental in developing strategic plans, policy papers, consultation papers, and reports for the Province of Ontario, the Government of Canada, and numerous stakeholder groups on issues related to the health workforce. Her focus is on using research as well as front-line experience to identify and analyze trends, and to influence policy and practice. Jean holds a Bachelor of Arts from the University of Toronto.

Appendix 2: Annotated Bibliography

Frank J., Chen L., Bhutta Z., Evans T., Fineberg H., Garcia P., Health professionals for the new century: transforming education to strengthen health systems in a independent world. *The Lancet*, 2010. 376, (9756), pp. 1923 – 1958

Frank et al. make suggestions for reform of professional education in the 21st century. They suggest that inadequate competencies from past decades will not be sufficient in transforming the next century of healthcare. Topics of discussion such as global change, institutional design and instructional change are noted as areas where reform should take place. Collaboration among all stakeholders in the health field is noted as key to shifting reform in healthcare in the future.

Horton R. A new epoch for health professional education. *The Lancet*, 2010. 376, pp. 1875-1878

Horton describes the history of professional health education while also making numerous suggestions as to how stakeholders can be part of future reform and change. Horton describes our current culture as being neglectful towards universities and describes their function as social institutions as a primary issue in healthcare professional education. Horton suggests that universities should be responsible for the health professionals they develop and offers ways in which institutions can ensure that this happens.

Watson, D., McGrail, K. More Doctors or Better Care? *Healthcare Policy*. 2009. 5 (1) pp. 26-32

Watson et al. describe the degree to which healthcare outcomes are related to physician supply. Through the use of OECD data, Watson et al. seek to align physicians supply targets with policy decisions. The authors suggest from their findings that there is no relationship between mortality and general practitioners per capita. They further suggest that this finding should be an indication that moving forward there may not necessarily a need for more physicians but instead there should focus on providing high quality healthcare; which involves finding a balance between the generalist-specialist mix.

Bates J. Lovato C., Buller-Taylor T. “Mind the Gap”: Seven Key Issues in Aligning Medical Education and Healthcare Policy. *Healthcare Policy*. 2008 4 (2) pp. 46-58

Bates et al. provide positive examples of how faculties of medicine are expanding and modifying their programs and training to ensure that enough physicians are being produced to meet societal needs. While this is a positive initiative, the authors urge that attention be directed towards the alignment of health services policy and education policy. The failure to consider policy may result in outcomes that do not best support and/or sustain innovations in medical education. The authors describe 7 key gaps that support the plan to expand medical schools while also addressing alignment issues.

Appendix 3: Semi-Structured Interview Questions

1. How successful have PGME policies in the last 10 years been at addressing:
 - a. Physician supply, mix and distribution
 - b. New service delivery models
 - c. Population health needs (e.g., primary care, mental health, diversity)
2. Are we attracting the right type and mix of students to postgraduate training programs? If not, what should we doing differently?
3. Is the current system of postgraduate training effective and efficient at producing independent practicing physicians? At producing physicians with the mix of skills and attitudes to work effectively as part of an interprofessional team? In new service delivery models?
4. Is the cost of postgraduate training justified by the output?
5. How can we maximize the contribution to the health system of an increased number of postgraduate trainees both in training and upon completion of training?
6. In your view, what are the key trends and issues in postgraduate medical education that must be addressed?
7. What three changes would you make to the current system of postgraduate training in Canada to: better address health system, service delivery and population health needs; increase efficiency and productivity; and maximize health outcomes?